Study on Self-directed Innovation and Measurement of Self-directed Degree of Innovation

ETUDE DE L'INNOVATION AUTONOME ET DE LA MESURE DU DEGRÉ D'INNOVATION AUTONOME

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Abstract: The capacity of self- directed innovation is emphasized now. It can help to improve the competitive strength of a country or an organization. The article studied the connotation, characteristics, mode and the independent degree of self-directed innovation. The most important characteristic of self-directed innovation is independent which includes initiative, dominant power to obtain and control the innovation property and innovation income. Self-directed innovation has more efficiency than technological import. At the technological level, the self-directed degree of innovation can be evaluated by the proportion between the value of following patent technology and the total value of all patent technologies. At the firm, area, industry and country level, it can be evaluated comprehensively by the proportion between the value of technology input, intellectual property right, innovation rent and the total value.
Key words: self-directed innovation, intellectual property right, Independent degree of innovation

Résumé: La capacité d'innovation autonome est accentuée maintenant. Elle peut aider à améliorer la compétitivité d'un pays ou d'une organisation. L'article présent étudie la connotation, les caractéristiques, le mode et le degré d'indépendance de l'innovation autonome. La caractéristique la plus importante est son indépendance qui comprend l'initiative, la puissance dominante pour obtenir et contrôler la propriété d'innovation et le revenu d'innovation. L'innovation autonome est plus efficace que l'importation technologique. Au niveau technologique, le degré d'innovation autonome peut être évalué par la proportion entre la valeur de la technologie suivante de brevet et la valeur totale des technologies de brevet. Au niveau de l'entreprise, de la région, de l'industrie et du pays, il peut être évalué globalement par la proportion entre l'entrée technologique, la propriété intellectuelle, le rendement d'innovation et la valeur totale.
Mots-Clés: innovation autonome, propriété intellectuelle, degré d'indépendance de l'innovation

With the reform and the open policy, our country's economy has created a miracle that maintained the yearly average to grow continually 9%. However, we should realize soberly that the traditional development pattern specially depends upon the high consumption of resources and the cheap- labor- force- crowded industry pattern. Energy, resources and the environment bottleneck more and more restrict the country's development. Under the new situation of economical globalization, the innovation already substituted for the natural resource to become the determining factor, which decides the nation's competitive power. Actually, the comprehensive nation's power depends on the whole our country's innovation capability. Therefore, promoting the whole country's innovation is a complex systematic project. Innovation, especially self-directed innovation has become the all-wave and strategic topic. Facing the acute national competition, the problem that the self-directed innovation capability is weak has got the key factor preventing the society development. As can be seen, strength or weakness of the self-directed innovation rapidly and intensely gets in touch with the competition power. The self-directed innovation is not the pure technological innovation, but it takes the technical innovation as the core. Simultaneously, it connects with the strategic innovation, the mechanism innovation, and the cultural innovation and so on each other. They promote and constitute mutually organic

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connecting systems. Sharpening the self-directed innovation ability and realizing the radical transformation of the economical growth way become urgent duty, which our country economy development faces. It also should be the urgent need facing the international competition. Improving the self-directed innovation ability becomes the core question that connects with national medium and long-term science and technology development plan, which will pay attention to the future national development strategy choice.

Recently, a keen argument about this topic has brought about. The focal point focuses on studying" the connotation about the self-directed innovation", "the relation between self-directed innovation and the introduction of the technology" and so on. Currently, the study of it more focus on enterprises. Little has been done on the point of areas and countries. Then, what is self-directed innovation and how to measure the self-directed innovation degree? Therefore, in this paper, the connotation, characteristics, and the self-directed degree of self-directed innovation will be studied.

1. CONNOTATION OF THE SELF-DIRECTED INNOVATION

The concept of innovation is most early proposed by Joseph Arab League Ross · Schumpeter (J. A. Schumpeter) who is an American nationality Austria economist. It emerged in his work" Economical Development Theory" in 1912. Schumpeter defined the innovation as one kind of the shift of production function, perhaps one kind of new combination of production function. Its goal lies in gaining latent excess profit. This definition stresses in the innovation of enterprise stratification. After the 20th century 50's, innovation theories are all from this rationale and develop. The domestic and foreign scholars have the different understanding to the innovation concept.

At the beginning of the 1950's, continuing Schumpeter's connotation, Solow has conducted more comprehensive research to the technological innovation. For the first time, he proposed the technological innovation two prerequisite: new thought origin and actual development in the following stage. This two-step theory was considered as an important milestone in the technological innovation concept research. Afterwards, Iraqi North and Freeman separately proposed the innovation formulation from behavior angle and economical angle.

The self-directed innovation must highlight the reliance. In domestic, the early self-directed innovation was defined as "grasping proprietary intellectual property rights, enabling the economy, the technology to have the independent characteristic innovation". Later, there was "the enterprise mainly breaks through the technical difficulty, forms the valuable research development achievement and depends upon own ability to impetus innovation in this foundation through own endeavor, then makes the technical achievement into commercialization and gains commercial profit. In the early time, the self-directed innovation and the technology that was introduced overseas, digested and absorbed, then was turned over into it was regarded as the different categories. The self-directed innovation and the imitation innovation, the self-directed innovation and the technical bought in were considered as the relative concept. Some scholars have given the quite broad definition, They thought that the connotation should carefully examine from the national stratification area, Changxin Guo thought the self-directed innovation referred to" the science and technology strategic concept which gaining the proprietary intellectual property rights, grasping core technologies as an objective, developing and conforming the innovation resources then carrying on innovation and improving the innovation ability"; Junkang Wan thought it referred to" through our country own study and the R&D activity, exploring the front technology, breaking through technological difficulty, researching and developing technology with the proprietary intellectual property rights, then forming the independent development ability"; Wei Hong thought" seeking the localization to develop the way"; Some scholars defined it from contrasting the technical introduction . For example Xiangcheng Ding and Qinhui Luo thought the self-directed innovation is a concept which opposed with the technical introduction, but Feng Lu thought it was not that. Xiaojuan Jiang thought there was one benign interaction relation between using exterior technological resource and the self-directed innovation. Jingan Zhang thought the self-directed innovation is the higher phase of technological innovation. Comparing with the self-directed innovation types from the Western country, some viewpoints from our country academic field and government was that the self-directed innovation is the independent innovation, the independent development or the self-research development. Some people thought that the self-directed innovation was endogenous innovation or the native innovates (indigenous innovation), other people regarded it as depending upon own innovation (innovation self-reliance).

We should unify our country's national condition to understand its connotation. Only does this, can we grasp the true connotation, and thus we can practice fluffily. The self-directed innovation includes the various contents about political, the economical, cultural, the military and social life each aspect. Its main body includes individual, the enterprise, the region, the industry and the country. Therefore, the self-directed innovation is of a series of main bodies' activity. In the new historical period, we should display activity and utilize various aspects of the knowledge and the resources in the economy and the social, and then create

the new productions which can bring the greatly economic efficiency or bring out new constructive thought, the method, the organization and so on. In the self-directed innovation process, it is more important we display the activity. Only activity displayed, can reliance realize truly. Simultaneously the different main bodes must display the function and use all factors. Each people all participate in the innovation activity. Therefore, the new thought and the behavior can be raised.

The self-directed innovation ability must be improved which was proposed in 16 session of Fifth Plenary Session. Enhancing the self-directed innovation ability has become the strategic basic point of the science and technology development and the core of adjusting the industrial structure. It is also the center of transforming economy growth way. Here "the innovation" is not the general innovation, but refers to the area of economy and technology specially. It is usually called the technological innovation. Here which is must be emphasized is that the so-called technological innovation only refers to the activity in the area of technology by no means, but covers the economic activity which can be able to bring new benefit in each aspect. This consists with our country current national condition. Technical department Vice-minister Yong Shang proposed that the self-directed innovation includes three meanings: the primitive innovation, the integrated innovation and the innovation, which is introduced, digested, absorbed then produced again. From the broad field, enhancing the construction about the self-directed innovation ability can be refined that, strengthening the primitive innovation ability construction in the basic research and the basic application domain, enhancing the integrated innovation ability construction of the significant general key technologies field and innovating again ability construction after the technical or thoughts having been introduced, digested and absorbed.

2. CHARACTERISTIC OF THE SELF-DIRECTED INNOVATION

2.1 The self-directed innovation has the distinct independent characteristic

The independency is that people must display human's activity and explain strategic arrangement, which the key technologies are under the control of others. Since many years' practice indicated that, the true core technologies cannot be bought. It originates from internal technological breakthrough of the country. Depending upon our own strength, our country obtains the core technologies by the independent researching and developing operation. This is the essential characteristic of the self-directed innovation. Much superiority about the self-directed innovation is also from this. Purely depending on the introduction, it is not impossible for a country to have the first-class leading technology of the world, without the prior technology, the internal impetus cannot be guaranteed which can make economical development secure. Then the superiority of the enterprise cannot be maintained in the economical globalization competition.

2.2 The self-directed innovations must have the originality

That is the new thought must be taken and the new theory, the new knowledge, the new technology, the new method and the new pattern must be had at the beginning; Its goal is yielding the new result. The new technical achievement has the monopoly. In the technical development competition, true legal winner is only one. Not only others later who have the similar achievement the registration monopolist's cannot receive legal in the origination the protection, but cannot use it legitimately. Therefore, in the identical market, the non-original self -directed innovation does not have the significance. The project of the self-directed innovation must look originality as its goal to pursue diligently, and then it will have hopes to success.

2.3 The self-directed innovation has the value characteristic

Namely obtaining the practical application value is the judgment of main standards whether the innovation succeeds or not. The achievement of the self-directed innovation must obtain the value, which can be acknowledged by the society. The technical achievement only commercializes as soon as possible, then it can bring the rich profit for the self-directed innovation unit. Correspondingly, it can prevent effectively the follower seizing the marketing and corroding its achievement. In the reality, the self-directed innovation has the lead with the market in the aspect of research and development. The self-directed innovation unit not only is in the technical cutting edge, but also does in the market .The superiority is precisely established by technical and the market two aspects to a great extent.

2.4 The self-directed innovation has the systematic characteristic

The main body is the multi-stratification planes. The country's innovational network mainly includes the government, the enterprise, the scientific research institution, the institutions and each kind of educational training organization. The government department is the main body that does the macroeconomic regulation and control, the consummation independent innovation

environment and provides the innovation system arrangement. The government pushes forward the cooperation and the exchange between each constituent and the international. The enterprise is the main body that pursues studying and developing, controls the innovation income, delivers and the income. The scientific research institution is the main body who has the strong technological resource, mainly provides the knowledge for enterprise's technological innovation; The institutions and each kind of education training organization are the main bodies that do human resources development and the basic research and provide the knowledge support for the technological innovation. The society intermediary is the main body that communicates the knowledge flowing, pushes forward the information proliferation.

2.5 The self-directed innovation has the high risk and the long-term characteristic

The self-directed innovation needs to rush out the road, which a predecessor has not passed through. The risk is very big. It is difficulty to success each time. It needs the loose innovative environment and the innovative culture. At the same time, the innovation often needs a very long cycle. We must prevent the tendency that purely pursue quantity and competes blindly in the advancement independent innovation process.

3. MEASUREMENT OF SELF-DIRECTED DEGREE OF INNOVATION

The measurement of self-directed degree of innovation is mainly carried on following several aspects:

3.1 The investment of Technical fund and the research and development fund can reflect the independent degree from an aspect

Higher the independent degree is, the more fund would be invested than before. Therefore, the study on the inputs of research and development fund is a important constituent. The inputs and the innovation independency have the very strong relevance. It is also necessary to estimate the innovation ability with some versatile parameter and the target. The incremental fund can be considered to express the independent intensity size. But this kind of reflection is not incomplete. R&D inputs do not reflect the output, the benefit of the independent innovation and the commercialization degree. If the pure investment does not bring the profit, the innovation cannot be brought out. It is only the resources waste. On the other hand, the self-directed innovation has the value characteristic. Therefore, the main measure may be done through the achievement. So the profit must be considered. It is one more scientific method that multiply contribution ratio which the self-directed innovation to the technical progress by the investment increment. But in the process of the self-directed innovation, the fund is not invested only one time; the following fund also needs to be considered. It is also extremely important to maintain the linear relations between the investment and the output.

3.2 The independent degree also may be weighed from the patent angle

Looking from the patent angle, if an innovation does not exist before, then we may think this technology is the primitive innovation; If a technique has been increased new difference technology characteristic, then we may think this technology is a digested- and -absorbed innovation; If a technique has been integrated all the patent before and has formed the new difference technology characteristic to combine and has had the coordination effect, or has been integrated completely including the part integration, then we may think this is integrated technological innovation. It is worth pointing out; sometimes the innovation only combines the patent technology step into a new one. This kind of innovation is possibly the primitive innovation, also possibly is digested-and- absorbed-again innovation.

Judging the independency of an innovation, first we must inspect the technology of this innovation whether is in the identical technical system with the existing technology of the product. If it is in the identical technical system, we must further inspect the innovation technology whether has been protected in existing technical extent. The primitive innovation technology and the existing technology are not in the identical technical system. The digested-and- absorbed-again innovation and the integrated innovation have the possibility with to be in the identical technical system in the technology, and it has the possibility to encroach upon the existing technical patent. Therefore, judging the independency of the innovation, we must inspect the influence the two innovations has done in the existing patent technology .If the influence on the innovation of the existing technology is bigger than that of the innovational technology, then the innovational technology has the independency. So it belongs to the independent innovation. From the patent competition angle, the mutual influence between the innovation technology and the existing technical may be determined according to the monopoly value appraisal. The proportion may estimate the independency of an innovation that following innovation patent technology value divides the total technical value. Supposing the innovation patent technology value is V_j, and the existing patent technology value is first $\sum_{j=1}^{n} Vj$, the

total value is $V_{j+}\sum_{j=1}^{n} Vj$, and then this innovation independency is

$$I = \frac{V_i}{\sum_{j=1}^{n} V_j + V_i}$$

4. THE CONCLUSION

The self-directed innovation is an activity that country, enterprise or the region carry on. It can bring a greater value to the main body. The biggest characteristic is the independency. It is not all self-directed innovation can succeed. Therefore, it has the permanent characteristic. The self-directed innovation is an action, which takes the proprietary intellectual property rights as the system safeguard, and it also is the innovation, which needs to adapt with own development. The independency may be measured by input and output; it also may weigh through the proprietary intellectual property rights. The self-directed innovation is a driving force of the economy development about the country, the enterprise and the region. It can enhance the competitive power and the anti-risk safeguard; the research on the self-directed innovation has the vital significance to our country.

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